$ 1.50

denver apple pi Seed

Newsletter for Denver's Apple users

Volume 6 Number 10 October 1984

the woz is coming!

Apple Pi is proud to announce that Steve Wozniak, inventor of the Apple computer and co-founder of Apple Computer, Inc., will be the guest speaker at Denver Apple Pi's October meeting. This meeting will be held at the Bunker Auditorium in the Green Center on the Colorado School of Mines Campus on Thursday, October 4th at 7:00pm.

Steve Wozniak, the WOZ, is one of the computer industries most colorful members. His first computer, to later be known as Apple I, was built in his partner Steve Jobs, Silicon Valley garage.

The first Apples had none of the fancy disk drives, printers, or other goodies we take for granted today, it didn't even have a case, just a few chips and a bunch of wires. In just a few short years the Apple has become a world leader in micro-computers and the WOZ has stayed in the middle of it all.

The WOZ has always been know as a practical joker. In his high school he invented a pen size device that would jam TV signals. As people watched TV he would turn it on, and before they would get to the set he would turn it off. You can imagine the rest. In school the WOZ wanted to be known for his pranks not his electronics. No doubt he was.

The Apple computer was invented while Steve worked for Hewlett-Packard. Because a lot of his thinking time was done at work he offered his invention to H.P. but was turned down. They did not feel that it was the type of thing that would ever amount to the type of product that they wanted to be known for. The WOZ had the foresight to get a total release for H.P. to sell his invention on his own. The rest is history.

If you would like to know more about Steve Wozniak I would suggest: WOZ The Prodigal son of Silicon Valley, by Doug Garr. This meeting proves to be the most intrestin yet and the officers hope that you will be able to attend. Tell a friend...THE WOZ IS COMING!

16 bit CPU for Apple

by Randall Ansley

Over the past few months you have been hearing about a new CPU chips for the Apple. The chips that have people talking about are the 65SC802 and the 65SC816, a 16 Bit version of the 6502. The chips are being produced by Western Design Center in Arizona and should be available in a few months. If you are a developer there is a developer program available and you can call me for more information(428-5627).

The The Apple is an 8-bit computer that is to say that the only 8 bits at a time can be passed from one place to another. Think of it as a large stadium with only 8 doors, it doesn't matter how many seats you have inside, only so many people can move in and out of the doors at a time. At this time you may use the 802 in your Apple as it is an 8 bit chip. In order for you to take full advantage of the 16 bit CPU you need a 16 bit bus. Another Arizona company called Com Log is making a card that will fit into one of your Apple slots (sorry //c folks) that will turn your Apple into a 16 bit computer (sorry IBM). What does this really mean? Speed, direct addressing, and power that you will not believe.

The following information is a little technical but I hope you will find it interesting.

The W65SC802 and the W65SC816 are OXI-CMOS microprocessors featuring total software compatability with their 8-bit NMOS and CMOS 6500-series predecessors. The W65SC802 is pin to pin compatable with 8-bit devices currently available, while the W65SC816 extends addressing to a full 16 megebytes. These devices offer the many advantages of the WDC's OXICMOS technology, including increased noise immunity, higher reliability, and greatly reduced power requirements. A software switch determines whether the processor is in the 8-bit "emulation" mode, or in the full 16-bit mode, thus allowing existing systems to use the expanded features.

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MEMBERSHIP INFORMATION
$10 APPLICATION FEE AND $18 PER YEAR DUES

APPLE PI is an Apple Computer Users Group - not affiliated with Apple Computer, Inc. - that provides many member benefits, some of which are:

MONTHLY MEETINGS-

On the first Thursday of each month at 7:00 p.m. APPLE PI holds its general meeting at the Greene Center, Colorado School of Mines Campus, Golden, Colorado. This meeting is a combination of an informational meeting, new product announcements, and a short business meeting. The members are given an opportunity to buy computer supplies a little above cost. Software products are given away as door prizes.

On the Sunday following the general meeting there is an informal meet which is usually held at the home of a member, the location of which is announced in the newsletter and at the general meeting. This meeting is from 10:00 a.m. until 3:00 p.m. and provides a more informal environment to seek or give advice to fellow members and get copies of programs from the APPLE PI Library. Both of these meetings are open to the general public but only members have access to products that are sold.

PROGRAM LIBRARY-

APPLE PI currently has a library of 8,000 programs. All current disks are in 16 sector (3.3, Pascal, CP/M) format and are available to any member. APPLE PI Members can obtain copies from the library:

1) By coming to the monthly informal meeting (swap meet);
2) By written request to the club librarian (at any meeting or by mail);
3) By electronic mail on APPLE PI's bulletin board system:

When requesting copies, please include the following information:

a) Your Name, Address, and Phone number;
b) Disk Category and Volume Number;
c) Blank Diskette(s) or request to utilize a new disk (member will be charged $2.50 for the new disk);
d) Copy fee ($1.00 per diskette side unless you donate a program you have written at the same time and fill out a Progam Submission Form). Only complete sides of disks will be copied.
e) Instructions on how the disks are to be returned, i.e., at the next meeting, by mail, etc. (IF RETURN IS TO BE BY MAIL PLEASE BE SURE TO INCLUDE A STAMPED, SELF-ADDRESSED FLOPPY DISK MAILER, AND $2.50 TO COVER SHIPPING COSTS).

DISK OF THE MONTH-

Each month a collection of some of the best programs donated to APPLE PI during the preceding month are made available. The DOM can be purchased at any group meeting or by mail.

DUES-

Current membership dues are $18.00 per year, with a one-time application fee of $10.00. Checks should be made payable to APPLE PI.

$3

65SC816

As shown in the processor programming model (Fig. 1), the Accumulator, ALU, X and Y index registers, and Stack Pointer registers have all been extended to 16 bits. A new 16-bit Direct Page register augments the Direct Page addressing mode (formerly Zero Page Addressing). Separate Program Bank and Data Bank registers allow 24-bit memory addressing.

Four new signals provide the system designer with many options. The ABORT input can interrupt the currently executing instruction without modifying internal registers. Valid Data Address (VDA) and Valid Program Address (VPA) outputs facilitate dual cache memory by indicating wether a data segment or program segment is accessed. Modifying a vector is made easy by monitoring the vector Pull (VP) output.

The Design Engineer for the new chips is William D. Mensch Jr. one of the people that worked on the 6502. The Data in the article was provided by Western Design Center Inc. and may change in specifictons before the final release.

W65SC816 Processor Programming Model

8 BITS	8 BITS		8 BITS
Data Bank Reg. (DBR)	X Register Hi (XH)	(X)	X Register Low (XL)
Data Bank Reg. (DBR)	Y Register Hi (YH)	(Y)	Y Register Low (YL)
00	Stack Register Hi (SH)	(S)	Stack Reg. Low (SL)
	Accumulator (B)	(C)	Accumulator (A)
Program Bank Reg. (PBR)	Program (PCH)	(PC)	Counter (PCL)
00	Direct Reg. Hi (DH)	(D)	Direct Reg. Low (DL)

Status Register Coding

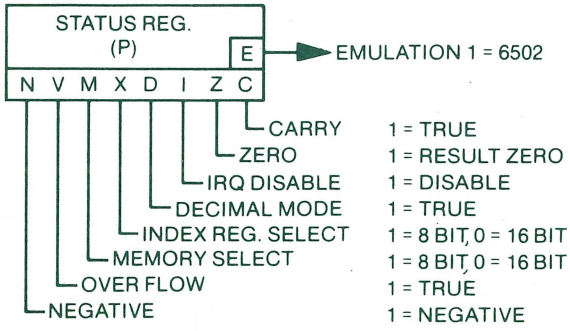


Figure 1

FEATURES-

- Advanced CMOS design for low power consumption and increased noise immunity.
- Single +5V power supply.
- Emulation mode allows complete hardware and software compatibility with NMOS 6502 code.
- 24-bit address bus allows access to 16 MByte of memory space.
- Full 16-bit ALU, Accumulator, Stack Pointer, and Index Registers.
- Valid Data Address (VDA) and Valid Program Address (VPA) output dual cache and cycle steal DMA implementation.
- Vector Pull (VP) output indicates when interrupt vectors are being addressed. May be used to implement vectors interrupt design.
- Abort (ABORT) input and associated vector supports interrupting any instruction without modifying memory or registers.
- Separate program and data bank registers allow program segmentation.
- New Direct Register allows "zero page" addressing anywhere in first 64k bytes.
- 24-addressing modes--13 original 6502 modes, plus 11 new addressing modes.
- New Wait for Interrupt (WAI) and Stop the Clock (STP) instructions further reduce power consumption, decrease interrupt latency and allows synchronization with external events.
- New Co-Processor instruction (COP) with associated vector supports co-processor configuration, i.e., floating point processors.
- New block move ability.

Instruction Set

W65SC816 Instructions (256 OP Codes)

A. The Original 6502 Instruction Set (151 Op Codes)

1. ADC — Add Memory to Accumulator with Carry
2. AND — "AND" Memory with Accumulator
3. ASL — Shift Left One Bit (Memory or Accumulator)
4. BCC — Branch on Carry Clear
5. BCS — Branch on Carry Set
6. BEQ — Branch on Result Zero
7. BIT — Test Bits in Memory with Accumulator
8. BMI — Branch on Result Minus
9. BNE — Branch on Result Not Zero
10. BPL — Branch on Result Plus
11. BRK — Force Break
12. BVC — Branch on Overflow Clear
13. BVS — Branch on Overflow Set
14. CLC — Clear Carry Flag
15. CLD — Clear Decimal Mode
16. CLI — Clear Interrupt Disable Bit
17. CLV — Clear Overflow Flag
18. CMP — Compare Memory and Accumulator
19. CPX — Compare Memory and Index X
20. CPY — Compare Memory and Index Y
21. DEC — Decrement Memory by One
22. DEX — Decrement Index X by One
23. DEY — Decrement Index Y by One
24. EOR — "Exclusive-or" Memory with Accumulator
25. INC — Increment Memory by One
26. INX — Increment Index X by One
27. INY — Increment Index Y by One
28. JMP — Jump to New Location
29. JSR — Jump to New Location Saving Return Address
30. LDA — Load Accumulator with Memory
31. LDX — Load Index X with Memory
32. LDY — Load Index Y with Memory
33. LSR — Shift One Bit Right (Memory or Accumulator)
34. NOP — No Operation
35. ORA — "OR" Memory with Accumulator
36. PHA — Push Accumulator on Stack
37. PHP — Push Processor Status on Stack
38. PLA — Pull Accumulator from Stack
39. PLP — Pull Processor Status from Stack
40. ROL — Rotate One Bit Left (Memory or Accumulator)
41. ROR — Rotate One Bit Right (Memory of Accumulator)
42. RTI — Return from Interrupt
43. RTS — Return from Subroutine
44. SBC — Subtract Memory from Accumulator with Borrow
45. SEC — Set Carry Flag
46. SED — Set Decimal Mode
47. SEI — Set Interrupt Disable Status
48. STA — Store Accumulator in Memory
49. STX — Store Index X in Memory
50. STY — Store Index Y in Memory
51. TAX — Transfer Accumulator to Index X
52. TAY — Transfer Accumulator to Index Y
53. TSX — Transfer Stack Pointer to Index X
54. TXA — Transfer Index X to Accumulator
55. TXS — Transfer Index X to Stack Register
56. TYA — Transfer Index Y to Accumulator

B. New W65SCXXX Instructions (13 Op Codes)

1. BRA — Branch Relative always
2. PLX — Pull X from Stack
3. PLY — Pull Y from Stack
4. PHX — Push X on Stack
5. PHY — Push Y on Stack
6. STZ — Store Zero in Memory (Direct; Direct, X; Abs; Abs, X)
7. TRB — Test and Reset Memory Bits Determined by Accumulator A (Direct and Absolute).
8. TSB — Test and Set Memory Bits Determined by Accumulator A (Direct and Absolute).

C. New W65SCXXX Addressing Modes (14 Op Codes)

2. BIT — Test Bits in Memory with Accumulator (Direct, X; Absolute, X; Immediate).
2. DEC — Decrement (Accumulator)
3. Group I — Instructions (Direct Indirect (8 Op Codes))
4. INC — Increment (Accumulator)
5. JMP — Jump to New Location (Absolute Indexed Indirect)

D. Group I Instructions with New Addressing Modes (48 Op Codes)

- Direct Indirect Long Indexed with Y (8 Op Codes)
- Direct Indirect Long (8 Op Codes)
- Absolute Long and Absolute Long Indexed with X (16 Op Codes)
- Stack Relative (8 Op Codes)
- Stack Relative Indirect Indexed Y. (8 Op Codes)

1. ADC — Add Memory to Accumulator with Carry
2. AND — "AND" Memory with Accumulator
3. CMP — Compare Memory and Accumulator
4. EOR — "Exclusive-or" Memory with Accumulator
5. LDA — Load Accumulator with Memory
6. ORA — "Or" Memory with Accumulator
7. SBC — Subtract Memory from Accumulator with Borrow
8. STA — Store Accumulator in Memory

E. New Push and Pull Instructions (7 Op Codes)

1. PEA — Push Effective Absolute Address or Immediate Data Word on Stack
2. PEI — Push Effective Indirect Address or Direct Data Word on Stack
3. PER — Push Effective Program Counter Relative Indirect Address or Program Counter Relative Data Word on Stack
4. PLB — Pull Data Bank Register from Stack
5. PLD — Pull Direct Register from Stack
6. PHB — Push Data Bank Register on Stack
7. PHD — Push Direct Register on Stack
8. PHK — Push Program Bank Register on stack

F. Status Register Instructions (2 Op Codes)

1. REP — Reset Status Bits Defined by Immediate Byte 1 = Reset
   0 = Do not change
2. SEP — Set Status Bits Defined by Immediate Byte 1 = Set
   0 = Do not change

G. New Register Transfer Instructions (8 Op Codes)

1. TCD — Transfer C Accumulator to Direct Register D
2. TDC — Transfer Direct Register D to C Accumulator
3. TCS — Transfer C Accumulator to Stack Register
4. TSC — Transfer Stack Register to Accumulator C
5. TXY — Transfer X to Y
6. TYX — Transfer Y to X
7. XBA — Exchange B and A
8. SCE — Exchange Carry Bit C with Emulation Bit E.

H. New Branch, Jump and Return Instructions (6 Op Codes)

1. BRL — Branch Relative Long Always (16 Bit Relative—32768 to + 32767) (Addressing Mode)
2. JML — Jump Indirect Long
3. JMP — Jump Absolute Long
4. JSL — Jump to Subroutine Long (Uses RTL for Return)
5. JSR — Jump to Subroutine (Indexed Indirect)
6. RTL — Return from Subroutine Long

I. New Block Move Instructions (2 Op Codes)

1. MVN — Move Block from Source (X Addressed) to Destination (Y Addressed), Block Length Defined by C, X; Y are Incremented.

2. MVP — Move Block from Source (X Addressed) to Destination (Y Addressed), Block Length Defined by C, X, Y are Decremented.

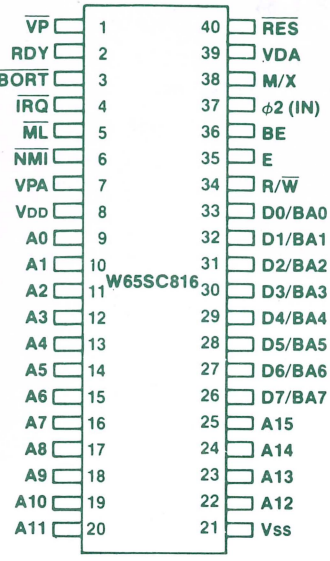
J. New Co-Processor Operations (1 Op Code)

1. COP — Co-Processor Instruction with Associated COP Vector and ABORT Input Supports Co-Processing Function i.e., Floating Point Processors, etc.

K. New System Control Instructions (3 Op Codes)

1. STP — Stop-the-clock Instruction Stops the Oscillator Input (or 02 Input) During 02 = 1. This Mode Is Released When RES Goes to a Zero. System Initialization May Be Desired; However, if After RESET One Performed an RTI, Program Execution Begins With the Instruction Following the STP Op Code in Program Sequence.
2. WAI — Wait for Interrupt Pulls RDY Low and Is Cleared by IRQ or NMI Active Input.
3. WDM — There is One Reserved Op Code Defined as WDM Which Will Be Used For Future Systems. The W65SC816 Performs a No-Operation.

Pin Configuration



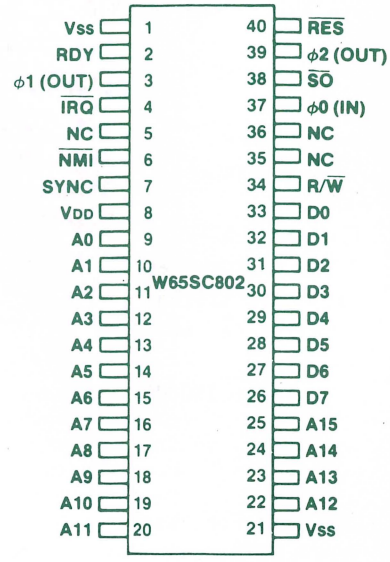


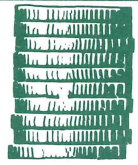
Table 3. Addressing Mode Summary

Address Mode	Instruction Times In Memory Cycles		Memory Utilization In Number of Program Sequence Bytes	
	Original 8 Bit NMOS 6502	New W65SC816	Original 8 Bit NMOS 6502	New W65SC816
1. Immediate	2	2(3)	2	2(3)
2. Absolute	4(5)	4(3,5)	3	3
3. Absolute Long	—	5(3)	—	4
4. Direct	3(5)	3(3,4,5)	2	2
5. Accumulator	2	2	1	1
6. Implied	2	2	1	1
7. Direct Indirect Indexed (IND), Y	5(1)	5(1,3,4)	2	2
8. Direct Indirect Indexed Long (IND), Y Long	—	6(3,4)	—	2
9. Direct Indexed Indirect (IND, X)	6	6(3,4)	2	2
10. Direct, X	4(5)	4(3,4,5)	2	2
11. Direct, Y	4	4(3,4)	2	2
12. Absolute, X	4(1,5)	4(1,3,5)	3	3
13. Absolute Long, X	—	5(3)	—	4
14. Absolute, Y	4(1)	4(1,3)	3	3
15. Relative	2(1,2)	2(2)	2	2
16. Relative Long	—	3(2)	—	3
17. Absolute Indirect (Jump)	5	5	3	3
18. Direct Indirect	—	5(3,4)	—	2
19. Direct Indirect Long	—	6(3,4)	—	2
20. Absolute Indexed Indirect (Jump)	—	6	—	3
21. Stack	3-7	3-8	1-3	1-4
22. Stack Relative	—	4(3)	—	2
23. Stack Relative Indirect Indexed	—	7(3)	—	2
24. Block Move X, Y, C (Source, Destination, Block Length)	—	7	—	3

NOTES:

1. Page boundary, add 1 cycle if page boundary is crossed when forming address.
2. Branch taken, add 1 cycle if branch is taken.
3. M = 0 or X = 0, 16 bit operation, add 1 cycle, add 1 byte for immediate.
4. Direct register low (DL) not equal zero, add 1 cycle.
5. Read-Modify-Write, add 2 cycles for M = 1, add 3 cycles for M = 0.

Tres. $



BEGINNING CASH BALANCE	8-1-84	6358.52
INCOME		
New Members		336.00
Renewal Members		390.00
DOM Sales		150.00
Library Copies		85.00
Sales of Supplies		1536.00
Seed Advertising		0.00
Interest Earned		23.22
TOTAL INCOME		2535.22
EXPENSE		
Supplies For Resale		3109.15
CSM Room Rental		0.00
Librarian Supplies		0.00
Printing Costs		785.00
Postage		27.50
Supplies & Copies		6.00
BBS Phone Bill & Repairs		0.00
State Sales Tax		0.00
Misc. Expense		30.00
Equipment Purchase		1041.00
TOTAL EXPENSE		4998.80
ENDING CASH BALANCE	8-31-84	3894.94
ASSETS	8-31-84	
Cash on Hand		50.00
Cash in Bank		3894.94
Inventory for Resale		6327.76
Prepaid Expense		150.00
Accounts Receivable		0.00
Equipment		2901.20
Total Assets		13323.90
LIABILITIES		
Sales Tax Accrued		157.82
Accounts Payable		0.00
Unposted Income		155.23
Total Liabilities		313.05
NET WORTH		13010.85

THANK YOU...

When you stop in to an Apple Pi member store tell them that you are with Apple Pi and thank them for the support they give. Our store members make valuable contributions to Apple Pi from special discounts to the door prizes at the meetings. When you need hardware, software or computer supplies remember our store members.

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JOHNNY APPLESEED

Dear John,

I don't want to trouble you with my stupid questions, but I need some help. In the last SEED, there was a very long article that talked about CP/M cards. I read the entire article, but I still have no idea what a CP/M card is even used for. I am wondering if I am too much of a beginner to be a member of Apple Pi, because there have many very technical (at least in my opinion) articles in the recent Seeds that I don't understand. Could you explain what a CP/M card is and what it is used for?

LOST IN AN APPLE

Dear Lost,

First of all, you are not too much of a beginner to be a member of Apple Pi. Apple Pi is a club that tries to support all levels of users, and thus we do publish some articles from time to time that require previous knowledge about certain subjects. You are correct, though, in saying that there have been many recently. We do our best to keep the material in the Seed well balanced, but we are only human, and the balance may not always be perfectly equal.

Actually, there are very many users who have no idea what a CP/M card is. I will do my best to briefly explain this common mystery.

A CP/M card is a circuit board that you put in one of the slots in the back of your Apple. This card has a different Central Processing Unit (CPU) that allows the Apple to act like another computer. CP/M stands for Control Program for Microprocessors. It is like DOS, and is an operating system. The card is needed to allow the computer to understand the language that CP/M uses.

That's wonderful, but why would anybody want to run another operating system? Very Simple. CP/M runs on many different brands of computers, and most CP/M software can be transfered to other computers that can run CP/M. Therefore, having a CP/M card allows you to run many programs that are writting for other machines. Some popular word-processors run in CP/M.

John

Dear John,

I am writing a game in Applesoft that would look best if it uses graphics and sound. I have the graphics part figured out, but I want to make the computer "buzz" when the player types in the wrong answer. How do I go about this?

"Buzzy as a Bee"

Dear Buzzy,

Here is a simple routine that will make a "buzz:"

```
10  FOR I=1 TO 99
    :SOUND=PEEK(-16336)
    :NEXT I
```

John

Send your problems or questions to:

Johnny Appleseed
% Denver Apple Pi
P.O. Box 17467
Denver, Colorado 80217-0467

All Questions will be answered, and become the property of Denver Apple Pi.

SOFTWARE SOFTWARE

At the last meeting of Apple Pi One of the guest speakers, Mike Westerfiel author of ORCA/M and other nationaly distributed programs, gave Apple Pi members a special deal on his software. If you missed the opertunity to get in on the action fear not, I have good news for you! Mike left me a few copies of "Crypto" and "ORCA Utilities" and said to go ahead and continue to give the members a 1/3rd off discount. If you want to take advantage of this please see me at the next meeting.

Randall Ansley

ASCII Express

by André Marc van Meulebrouck

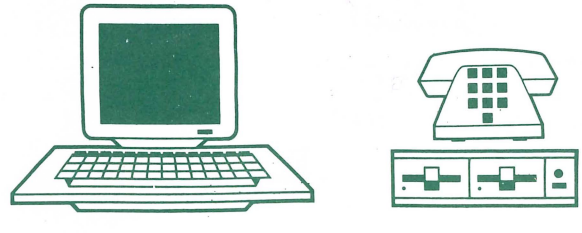
The word macro implies the idea of text replacement. In telecommunication packages, it means a string of text that is activated by a few keystrokes to save you typing.

If you have the telecommunications package, Ascii Express "the Professional", you can write very elaborate macros. In this article I will present the macro I wrote to dial the Pi BBS at 1200 baud. It will also work at 300 baud. This macro will dial the board indefinately until a connect is established, then the copy buffer is turned on to download the session, then all your mail is read (if you have any), next, all new bulletins are read (if there are any), finally, the macro will log you off. Once off-line, the entire session can be played back or written to disk. If you wanted, you could have the macro issue the write to disk command. The execution of Ascii Express macros can be halted at any point by carriage returns, so if you have an automatic macro, and want to stop it (to reply to your e-mail for example), simply hit returns until the macro stops. I have neither the time nor desire to explain this macro in its entirety, however, I will provide some explanation and tips. First of all, my macro does work (I use macros everyday, and this one, despite the changes I've made, has been thoroughly tested). An important tip to keep in mind when writing macros is: if your macro stops, and you're sure of the logic, then it may be a timing problem. Try putting in asterisks. They create delays. Most computers can't recieve as fast as they send, so delays are often necessary. I need a delay in my name. If I don't have one, the board misses one of the 14 letters of my last name, even at 300 baud. Also, I recommend handshaking (waiting) on key words. By keeping track of key words that have passed by, you can insure that you are where you think you are in the transmission. Picking key words to wait for (handshake on) is tricky. They must be so unique that words which appear in e-mail and bulletins cannot supply them inadverteny sure you'll agree that my choice of " A UTO" as a key word to wait for in my macro was a good one, since the likelyhood of someone putting that in a bulletin or e-mail message is slim. Read your documentation for Ascii Express to understand this macro and to learn how to type it in and put it into a library. You can set up this macro to be a turn key system if you install a copy of AE to run this macro on boot-up. With a timer added, and the write buffer to disk command added, you could have your computer turn on, running AE on boot-up, tie in, record the session on disk, then have the timer shut your system down a reasonable length of time later. My macro must be invoked from line one. This is customary. Don't let line zero confuse you into thinking the macro starts there! The keystrokes I use to invoke my macro is W 1. If you have not configured differently, you will use the same command. If you install to run a macro on boot up, don't forget to specify line one as the line to start the macro on! Since I have an external modem, I must dial within a macro. Thus, my macro is designed to dial. If you don't need to dial from within a macro, eliminate the dialing logic on line zero and change line one. If you have an external modem, and it follows Hayes conventions, you can use the macro as is. For Hayes external modems, AT means attention. MO turns off the speaker (if it redials for any length of time, you will want to turn off the speaker). To hear what is going on, listen on the phone, or, turn the speaker on (M1). S7=15 sets the S7 register in the Hayes to 15 seconds. The S7 register decides how long the modem will wait for a carrier. If your modem fumbles connections, this may be too quick. Increase it to something greater than 15. D means dial, and T means to dial via tone rather than pulse (tone is more reliable). The macro follows.

```
#0 *AT MØ S7=15 D T 469-7541'~RT2\LØ
#1 \C*\LØ
#2 %-JOEUSER'%-PASSWORD'\R'⟨MARTIN⟩\L3
#3 ~!=6%?Y*'\L4
#4 ⟨[A]UTO⟩\L5
#5 ~R?6%:C*'~?-4\L6
#6 %:B*'⟨OPTION⟩⟨HELP⟩%:N*'⟨BULLETINS⟩~NC8\L7
#7 %:A*'%:T*'%?Y*'
#8 ⟨[A]UTO⟩%:N*'~?⟩8⟨HELP⟩\L7
```

If you are a club officer, with the option of saving your mail or deleting it, you can change line 6 to delete or save your mail. The line you will need to delete it follows.

```
#7 %:A*'%:T*'%?Y*'%?Y*''
```



$9

VP's SNEAK PREVIEWS

Well, as you know the Woz is coming. I am ecstatic. It makes me glad I became VP! Originally, I was asked to become VP by the nominating commitee, and I refused (mostly due to the time commitment). Two weeks later, after alot of vascillation, I reluctantly accepted when I was asked again. This makes all of it worthwhile.

As many of you know, I invited Woz shortly after I became VP. After the film footage of Wozniak was shown at the club meeting around the time of the change of administrations, I decided it would be alot of fun to have Woz come and speak. There was not a dry eye in the place--everyone was in stitches from Woz's jokes, which, when repeated to non-Apple fanatics fell flat on the floor ("you had to have been there"). I think only Mr. Wozniak can tell Woz jokes successfully.

So, I wrote a letter to Woz. In part of the letter, I described Colorado as THE place to visit, and explained why. After I mailed the letter, I had a strange feeling Woz would shock us all, and actually come. I told the other officers this, and no one laughed--thanks for your optimism.

One of the officers of the former administration encouraged my naivety and moxie in writing Woz. He and I never counted Woz out. Our philosophy was basically: "What the h*ll? It doesn't hurt to ask!". That is very true--Woz was in Ohio for a computer show, and never spoke to the users's group there. I asked a key officer there why. He did not know. I asked whether they had INVITED him to speak. He said they hadn't!

After forgetting I even wrote to Woz, I got a response: "I'd be delighted to help!", and he left his number(s). When I talked to Woz the first time, he told me I didn't need to write all the stuff about Colorado, as he had lived in Colorado in the past. Then he asked when I thought the leaves would be turning!

It was hard to keep this a secret from all of you for so long, but I wanted to wait until Woz officially confirmed.

"But why is Woz really coming to see us?", you may be wondering. Well, I think basically we are just very very lucky. We are not the biggest club, nor the best perhaps. We are probably one of the most enthusiastic clubs, but all in all I think the reason Woz is coming to visit us is just that we are simply lucky!

Any guest speakers I plan after this will be...well, you know, Woz will be a hard act to follow. Please don't lose interest after October, stay with us!

November--the people slated for October? They called recently, and apologetically told me October would be a bad month for them, and had trouble believing me when I assured them: "No problem!". Also, want to get someone to demo the Rana drives that we did not see last time. Let me know if this sounds good, or what you would prefer. November will be the last speaker this year (December's a Christmas party).

January--new Mac products from Microsoft. Jonathan Kantor of Microsoft will demonstrate new Mac software and try to answer any questions you have on Microsoft products in general. This month will be the one year anniversary for the Mac. Where is it now, and where is it going?

SECRETARY'S REPORT

Apple Pi's Sept. meeting had a varied menu - enough to please the novice and expierenced Apple user alike. Trent Hein demonstrated the special Golden D.O.M. - still available for purchase at CORE meets.

Cyberlynx Computer Products demon-strated their Home Control Security System, ALF demonstrated the 8088 processing system, and DC3 drive controller. Also Michael Westerfield discussed Orka drives and Crypto. A very large thanks to all of them for making our Apple Pi meeting worth attending!

The door prize, Crypto, was won by Mr. Andras Schmidt.

Neighborhood Computer Store offered members many great buys at the meeting-thanks for being there, Neibhorhood. Don't miss out on the goings on at meetings and CORE meets-get what you paid for with your membership!

AT THE CORE MEET

THE APPLE AND THE FAMILY
PLUS; EARLY EDUCATION DEMOS

---What can the Apple do for me, the homemaker?

---What software, other than games, is available for kids, (ages 18 mos. to approx. 6th grade)?

---Can preschoolers learn basic academic facts faster and easier on a computer?

---My wife/husband won't go near it, how can she/he "get a grip" on computing

---Apple Pi library software pinpointed for your convenience-much is avalb here for families and only $1.00 each program!!!

---Software, literature, available for your inspection and "hands on" demos for you and the kids.

SEE YOU ANYTIME FROM 10A TO 3P AT THE OCT. CORE MEET!

QUESTIONS? LIANE NUSSE 279-5763

NOTE FROM PRES.

October,1984 will be a month that members will remember for a long time with Steve Wozniak , co-founder of Apple Computer, as our speaker. We have arranged for the use of the large auditorium in the Green Center in lieu of our normal meeting room. Seating will be on a first come first served basis, so you may not want to be late.

We have decided to hold the CORE meets at the Clear Creek Office Park complex (formerly the KKBNA building) every month for the indefinite future. The address is 4251 Kipling. It is just south of I-70 on Kipling. It is hoped that by having the CORE meets at one location, all will know how to get there. CORE meets will still be the Sunday following the monthly general meeting from 10 a.m. till 3 p.m. For all the new members, this is when Apple Pi has its software and publications available for the membership. There are over 8,000 programs in the library now and disk copies are still only $1.00 per disk side. Thanks to the great facilities we have at the Clear Creek Office Park building, we can demonstrate programs, help members with their hardware problems (simple things), and discuss things on an informal basis. If you haven't been to a CORE meet, you should take the time to come some month. Bring along a few blank disks so we can get you hooked on our library.

Apple Pi is still trying to locate the right individual to be our Store Representative Officer. This position is our interface with our store members and arranges for their advertisements in the SEED and for their sales tables at our general meetings. If you are at all interested, please contact me directly and we will discuss the job.

November will be an interesting meeting for those of you who like to see what the current games on the market are about and demonstrations on some newly developed software. This is just in time for Christmas. We will also have some people from Auraria Bookstore to show us some HP equipment/printers. Then in December is the annual Apple Pi Christmas Party. There are always lots of door prizes atte Christmas Party - - Plan to come, its worth it.

Bob Hein

LIBRARIAN'S REPORT

September was a great month as far as contributions to the library go. We had many contributions, and you will be seeing those on the October DOM. I want to thank all of those who contributed programs to that library, and I would like to encourage YOU to contribute a program yourself!

Also, we received a new disk from IAC that has many programs for use with APPLE LOGO. These programs will probably never appear on a DOM, but they are available in the IAC section of the library.

Seeing that we are getting closer to Christmas with every day, please start writing your programs for our annual Christmas Disk. Whether it be graphics, music, or text, we need Christmas-related programs for our Christmas Disk!

Finally I would like to remind you to be sure and update your catalog disk at the next Core meet. There are many new programs added each month, so be sure that you have the most recent copy possible.

-- Trent Hein, Librarian --

W65SC816 Microprocessor Op Code Matrix

MSD \ LSD	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0	BRK s 2 8	ORA(d,x) 2 6	COP s 2*8	ORA sr 2*4	TSB d 2●5	ORA d 2 3	ASL d 2 5	ORA(dl) 2*6	PHP s 1 3	ORA imm 2 2	ASL acc 1 2	PHD s 1*4	TSB a 3●6	ORA a 3 4	ASL a 3 6	ORA al 4*5	0
1	BPL r 2 2	ORA(d),y 2 5	ORA (d) 2●5	ORA(sr),y 2*7	TRB d 2●5	ORA d,x 2 4	ASL d,x 2 6	ORA(dl),y 2*6	CLC imp 1 2	ORA a,y 3 4	INC acc 1●2	TCS imp 1*2	TRB a 3●6	ORA a,x 3 4	ASL a,x 3 7	ORA al,x 4*5	1
2	JSR a 3 6	AND(d,x) 2 6	JSL al 4*8	AND sr 2*4	BIT d 2 3	AND d 2 3	ROL d 2 5	AND(dl) 2*6	PLP s 1 4	AND imm 2 2	ROL acc 1 2	PLD s 1*5	BIT a 3 4	AND a 3 4	ROL a 3 6	AND al 4*5	2
3	BMI r 2 2	AND(d),y 2 5	AND(d) 2●5	AND(sr),y 2*7	BIT d,x 2●4	AND d,x 2 4	ROL d,x 2 6	AND(dl),y 2*6	SEC imp 1 2	AND a,y 3 4	DEC acc 1●2	TSC imp 1*2	BIT a,x 3●4	AND a,x 3 4	ROL a,x 3 7	AND al,x 4*5	3
4	RTI s 1 7	EOR(d,x) 2 6	WDM RESERVED*	EOR sr 2*4	MVP xyc 3*7	EOR d 2 3	LSR d 2 5	EOR(dl) 2*6	PHA s 1 3	EOR imm 2 2	LSR acc 1 2	PHK s 1*3	JMP a 3 3	EOR a 3 4	LSR a 3 6	EOR al 4*5	4
5	BVC r 2 2	EOR(d),y 2 5	EOR (d) 2●5	EOR(sr),y 2*7	MVN xyc 3*7	EOR d,x 2 4	LSR d,x 2 6	EOR(dl),y 2*6	CLI imp 1 2	EOR a,y 3 4	PHY s 1●3	TCD imp 1*2	JMP al 3*4	EOR a,x 3 4	LSR a,x 3 7	EOR al,x 4*5	5
6	RTS s 1 6	ADC(d,x) 2 6	PER s 3*6	ADC sr 2*4	STZ d 2●3	ADC d 2 3	ROR d 2 5	ADC(dl) 2*6	PLA s 1 4	ADC imm 2 2	ROR acc 1 2	RTL s 1*6	JMP (a) 3 5	ADC a 3 4	ROR a 3 6	ADC al 4*5	6
7	BVS r 2 2	ADC(d),y 2 5	ADC(d) 2●5	ADC(sr),y 2*7	STZ d,x 2●4	ADC d,x 2 4	ROR d,x 2 6	ADC(dl),y 2*6	SEI imp 1 2	ADC a,y 3 4	PLY s 1●4	TDC imp 1*2	JMP(a,x) 3●6	ADC a,x 3 4	ROR a,x 3 7	APC al,x 4*5	7
8	BRA r 2●2	STA(d,x) 2 6	BRL rl 3*3	STA sr 2*4	STY d 2 3	STA d 2 3	STX d 2 3	STA(dl) 2*6	DEY imp 1 2	BIT imm 2●2	TXA imm 1 2	PHB s 1*3	STY a 3 4	STA a 3 4	STX a 3 6	STA al 4*5	8
9	BCC r 2 2	STA(d),y 2 6	STA (d) 2●5	STA(sr),y 2*7	STY d,x 2 4	STA d,x 2 4	STX d,y 2 4	STA(dl),y 2*6	TYA imp 1 2	STA a,y 3 5	TXS imp 1 2	TXY imp 1*2	STZ a 3●4	STA a,x 3 5	STZ a,x 3●5	STA al,x 4*5	9
A	LDY imm 2 2	LDA(d,x) 2 6	LDX imm 2 2	LDA sr 2*4	LDY d 2 3	LDA d 2 3	LDX d 2 3	LDA(dl) 2*6	TAY imp 1 2	LDA imm 2 2	TAX imp 1 2	PLB s 1*4	LDY a 3 4	LDA a 3 4	LDX a 3 4	LDA al 4*5	A
B	BCS r 2 2	LDA(d),y 2 5	LDA(d) 2●5	LDA(sr),y 2*7	LDY d,x 2 4	LDA d,x 2 4	LDX d,y 2 4	LDA(dl)y 2*6	CLV imp 1 2	LDA a,y 3 4	TSX imp 1 2	TYX imp 1*2	LDY a,x 3 4	LDA a,x 3 4	LDX a,y 3 4	LDA al,x 4*5	B
C	CPY imm 2 2	CMP(d,x) 2 6	REP imm 2*3	CMP sr 2*4	CPY d 2 3	CMP d 2 3	DEC d 2 5	CMP(dl) 2*6	INY imp 1 2	CMP imm 2 2	DEX imm 1 2	WAI imp 1*3	CPY a 3 4	CMP a 3 4	DEC a 3 6	CMP al 4*5	C
D	BNE r 2 2	CMP(d),y 2 5	CMP (d) 2●5	CMP(sr),y 2*7	PEI s 2*6	CMP d,x 2 4	DEC d,x 2 6	CMP(dl),y 2*6	CLD imp 1 2	CMP a,y 3 4	PHX s 1●3	STP imp 1*3	JML (a) 3*6	CMP a,x 3 4	DEC a,x 3 7	CMP al,x 4*5	D
E	CPX imm 2 2	SBC(d,x) 2 6	SEP imm 2*3	SBC sr 2*4	LPX d 2 3	SBC d 2 3	INC d 2 5	SBC(dl) 2 6	INX imp 1 2	SBC imm 2 2	NOP imp 1 2	XBA imp 1*3	CPX a 3 4	SBC a 3 4	INC a 3 6	SBC al 4*5	E
F	BEQ r 2 2	SBC(d),y 2 5	SBC (d) 2●5	SBC(sr),y 2*7	PEA s 3*5	SBC d,x 2 4	INC d,x 2 6	SBC(dl),y 2*6	SED imp 1 2	SBC a,y 3 4	PLX s 1●4	XCE imp 1*2	JSR(a,x) 3*6	SBC a,x 3 4	INC a,x 3 7	SBC al,x 4*5	F

Op Code Matrix Legend

INSTRUCTION MNEMONIC	(COMMENT)	ADDRESSING MODE
BASE NO. BYTES		BASE NO. CYCLES

* New W65SC816 Op Codes
● W65SC02 Op Codes

COME TO THE MEETING EARLY... ... AND GET A GOOD SEAT!

Core Meeting

KKBNA INC.

4251 Kipling

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